CLAIMS

We claim:

1. A lockout tool for locking a subsurface safety valve in the open position, wherein the safety valve comprises a pressure containing body having a bore therethrough, a valve closure member disposed in the bore moving between an open and a closed position, a flow tube axially moveable in the body, a non-moveable seat adjacent the valve closure member, and an actuating means for translating the flow tube longitudinally in the bore, said lockout tool comprising:

an elongated housing adapted to fit inside the subsurface safety valve;

a mandrel moveable in the housing;

at least one dog, which, upon controlled movement of the mandrel, engages and moves the flow tube in a direction to place the valve closure member in its open position; and

a plurality of expander points in substantially circumferential arrangement inside the housing, and adapted to move into radial engagement with an inside diameter of the flow tube after the at least one dog has moved the flow tube to open the valve closure member in its open position, said expander points being urged to move radially outward with sufficient force to yield and expand a diametrical portion of the flow tube into engagement with the non-moveable seat in the safety valve, thereby permanently locking the valve closure member in the open position.

2. The lockout tool of claim 1, wherein the housing comprises a ball housing portion that houses the plurality of expander points.

3. The lockout tool of claim 2, wherein the expander points define balls.

4. The lockout tool of claim 2, wherein the expander points define dogs.

5. The lockout tool of claim 1, wherein the housing defines a plurality of sub-housings.

6. The lockout tool of claim 5 wherein the plurality of sub-housings comprises:

a no-go housing, the no-go housing having an outer beveled surface for landing onto a beveled profile along the inner surface of the safety valve;

an upper housing, with at least one dog residing within the upper housing; and

a ball housing, the expander points residing along the ball housing

7. The lockout tool of claim 6, further comprising a stem at least partially slidably received within the housing.

8. The lockout tool of claim 7, wherein the stem comprises an upper portion configured to be coupled to a run-in tool, and a lower extension portion coupled to the expander mandrel.

9. The lockout tool of claim 8, wherein the upper portion of the stem is a part of a wire line stem used in connection with oil field jars,

10. The lockout tool of claim 8, wherein the upper portion of the stem is connected to a string of coiled tubing for run-in.

11. The lockout tool of claim 7, wherein:

the lockout tool further comprises a carrier sleeve axially movable within the housing; and

the at least one dog comprises at least one flow tube dog carried by the carrier sleeve within the housing.

12. The lockout tool of claim 11, wherein the lockout tool further comprises at least one locking dog for maintaining the position of the lockout tool within the safety valve during the lockout process.

13. The lockout tool of claim 12, wherein the locking dog is also carried by the carrier sleeve.

14. The lockout tool of claim 13, wherein the lockout tool further comprises at least one carrier sleeve no-go dog carried by a carrier sleeve within the housing, the at least one carrier sleeve no-go dog shifting the carrier sleeve downward in response to downward movement of the stem.

15. The lockout tool of claim 14, wherein the stem further comprises a shoulder for contacting the carrier sleeve no-go dog when the stem is urged downward, thereby contacting the at least one carrier sleeve no-go dog and urging the carrier sleeve downward.

16. The lockout tool of claim 15, wherein the lockout tool further comprises at least one carrier sleeve locking dog for preventing the carrier sleeve from moving before the shoulder of the stem contacts the at least one carrier sleeve no-go dog.

17. The lockout tool of claim 1, wherein the expander mandrel is moveable in the housing in response to mechanical force.

18. The lockout tool of claim 1, wherein the expander mandrel is moveable in the housing in response to hydraulic force.

19. A lockout tool for locking a subsurface safety valve in the open position, the safety valve comprising a housing having a bore therethrough, a flapper member disposed in the bore, the flapper being movable between an open

position and a closed position by a flow tube, a non-moveable seat adjacent the flapper member, and an actuating means for translating the flow tube longitudinally in the bore in order to maintain the flapper in the open position, the lockout tool comprising:

an elongated housing dimensioned to be received within the subsurface safety valve, the housing having a bore therethrough, and having a recess;

a mandrel received within the bore of the housing, and being moveable along a longitudinal axis of the housing, the mandrel including an enlarged diameter portion; and

a plurality of expander points radially disposed within the recess of the housing, the expander points being arranged to ride along the mandrel as the mandrel is received within the lockout tool housing, and to be urged outwardly as the enlarged diameter portion of the mandrel passes through the plurality of expander points, thereby causing the expander points to engage an inside diameter of the flow tube such that the expander points expand a diametrical portion of the flow tube into engagement with the non-moveable seat so as to lock the flapper in the open position.

20. The lockout tool of claim 17, further comprising:

at least one dog which, upon controlled movement of the mandrel, engages and moves the flow tube in a direction to maintain the flapper in the open position.

21. The lockout tool of claim 18, wherein the expander points define balls.

22. The lockout tool of claim 18, wherein the expander points define dogs.

23. A method for locking a subsurface safety valve in the open position, the safety valve comprising a housing having a bore therethrough, a flapper member disposed in the bore, the flapper member being movable between an open position and a closed position by a flow tube, a non-moveable seat substantially

surrounding the flow tube, and an actuating means for translating the flow tube longitudinally in the bore in order to maintain the flapper member in the open position, the method comprising the steps of:

running a lockout tool into a wellbore, the lockout tool comprising:

an elongated housing dimensioned to be received within the subsurface safety valve, the housing having a bore therethrough, and having a recess;

a mandrel received within the bore of the housing, and being moveable along a longitudinal axis of the housing, the mandrel including an enlarged diameter portion; and

a plurality of expander points radially disposed within the recess of the housing, the expander points being arranged to ride along an outer diameter of the mandrel as the mandrel is received within the lockout tool housing, and to be urged outwardly as the enlarged diameter portion of the mandrel passes through the plurality of expander points;

locating the lockout tool into the subsurface safety valve;

moving the flow tube downward, thereby opening the flapper member;

urging the expander mandrel downward relative to the lockout tool housing, causing the enlarged diameter portion to pass through the plurality of expander points, and thereby causing the expander points to engage an inside diameter of the flow tube such that the expander points expand a diametrical portion of the flow tube into engagement with the non-moveable seat in the safety valve so as to lock the flapper member in the open position.

24. The method of claim 23, wherein the non-moveable seat in the safety valve defines the hard seat for receiving the flapper member when the flapper member is in the closed position.

25. The method of claim 24, wherein the lockout tool is run into the wellbore on a slickline.

26. The method of claim 25, wherein the expander mandrel is urged downwardly by using a set of jars.

27. The method of claim 25, wherein the lockout tool is run into the wellbore using coiled tubing.

28. The method of claim 27, wherein the expander mandrel is urged downwardly by applying hydraulic pressure through the coiled tubing.

29. The method of claim 23, wherein the expander points define balls.

30. The method of claim 23, wherein the expander points define dogs.

31. The method of claim 23, wherein the step of urging the expander mandrel downward is accomplished mechanically.

32. The method of claim 23, wherein the steo of urging the expander mandrel downward is accomplished hydraulically.

33. A method for expanding a first tubular body into a surrounding second tubular body, comprising the steps of:

attaching the first tubular to a lockout tool, the lockout tool comprising:

an elongated housing dimensioned to be received within the first tubular, the housing having a bore therethrough, and having a recess;

a mandrel received within the bore of the housing, and being moveable along a longitudinal axis of the housing, the mandrel including an enlarged diameter portion; and

a plurality of expander points radially disposed within the recess of the housing, the expander points being arranged to ride along an outer diameter of the mandrel as the mandrel is received within the lockout tool

housing, and to be urged outwardly as the enlarged diameter portion of the mandrel passes through the plurality of expander points;

running the first tubular and the attached lockout tool into a wellbore;

urging the expander mandrel downward relative to the lockout tool housing, causing the enlarged diameter portion to pass through the plurality of expander points, and thereby causing the plurality of expander points to engage an inside diameter of the first tubular such that the expander points expand a diametrical portion of the first tubular into engagement with the second tubular so as to lock the first tubular into frictional engagement with the second tubular at a selected depth.

34. The method of claim 34, further comprising the steps of:

pulling the lockout tool out of the wellbore;

running into the wellbore with an expander tool;

locating the expander tool at a depth in the wellbore adjacent the first tubular;

actuating the expander tool;

translating the expander tool along a desired length within the first tubular, thereby further expanding the first tubular into further frictional engagement with the second tubular.

35. The method of claim 34:

wherein the expander tool is a hydraulically actuated, rotary expander tool; and

wherein the method further comprises the step of rotating the rotary expander tool while translating the expander tool along a desired length within the first tubular.

36. The method of claim 34, wherein the expander points define balls.

37. The method of claim 34, wherein the expander points define dogs.